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**MATH CITY  
IS  
A MUST  
IN  
CHENNAI**

**RAMANUJAN MUSEUM & MATH  
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ISSUED 04-11-1999

Mathematics  
is the King of  
all Arts  
and  
The Queen of  
all Sciences



## **MATH CITY IS A MUST IN CHENNAI**

We are living in the times that demands mathematics literacy on the part of every one, more so of the rising generation. Computer literacy is in the air but not mathematics literacy. Just as without sanitation, hygiene alone will be incongruous, so is computer literacy without mathematics literacy. Though mathematics is an art like music and dancing, painting and poetry etc., there is a sociological vacuum for recognising the mathematical core in man and fostering and nurturing it as in fine arts and sports. There has been a long tradition to cater to religious and political, fine art and literary, sports and make up needs of man supported and heightened by high tech developments. One can survive as an illiterate but not as an innumerate. While talking of science and technology, there is a lack of awareness on the part of the common man even today that it is really mathematics, science and technology, what with mathematisation characterising almost every branch of knowledge and problem solving in almost every sphere of human endeavour through mathematical modelling.

### **SCENARIO AS IT IS TODAY**

What is the scenario today? Almost all who have had or do schooling are familiar with exam math with its single answer responses for which training is given by rule, rote and drill, model based exercises and readiness tests routinely and frequently held. Every school goer gets exposed to the computational and manipulative skills in mathematics, but rarely is mathematics presented as an avenue for appreciation of beauty and power as seen through underlying patterns, relations and structures. However much a few knowledgeable educators decry this state of affairs that deprives a learner of developing insight into mathematical ways of thinking, there is pronounced resistance to change and innovation particularly at the school level, primary level for that matter, as the teachers are products of this system and parents have no knowledge of the tremendous changes that are taking place in mathematics education. Departmental agencies take shelter under the plea that they have no time for academic matters as the administrative responsibilities are overwhelming. It is just the operation of the law of least resistance.



That mathematics education has emerged as a separate discipline with setting up of separate departments of mathematics education in universities of advanced countries is news today even to the educated in our country. The situation is aggravated by lack of professionalism on the part of working teachers as administration at all levels is geared to exam preparation and exam coaching, what with guides and tuition centres, patronised by parents. Practically nothing is done to promote professional growth of math teachers. There is no climate for mathematics outside the classroom. Mathematics gets shunned from school festivals, family life and social life events. This is all a continuation of the past. Even the periodicals particularly those in Tamil are reluctant to cover articles of mathematical interest, as the persons who opt out for journalism are allergic to mathematics. If at all some space is given for features mathematical in character, only tit bits like puzzles and conundrums of the usual type are given berth. The plea is that mathematics is not of readers' interest. This is crass pandering to the prevailing tastes of people and not their development. When mathematics is the only subject with which phobia is associated, this suicidal attitude is an un understandable if not deplorable. Even the schools that publish magazines, souvenirs or school annuals continue to suffer from this malaise. Very few read articles of mathematical and mathematically educational interest that appear in English periodicals. In this age of science and technology, science journals are not as popular as they should be. No science or math journal can survive without coverage of exam questions, entrance or otherwise.

This scenario must change if we as a nation were to match up to intellectual stature of advanced countries. Let us not forget that while we can boast of some Nobel prize-winners, there is no Field medalist among our mathematicians subject to correction. Nobel prize is not given for mathematics. Its equivalent in mathematics is a Field Medal.

### **SCENARIO AS IT SHOULD BE**

2000 AD has been declared WORLD MATHEMATICS YEAR. RAMANUJAN MUSEUM and MATHEMATICS EDUCATION CENTRE which has been pioneering, crusading and propagating strategies for sea change in this scenario that has been debilitating the nation has been evolving ways and means of bringing



about desirable state of affairs. Some of the programmes are successful enough to catch the imagination of the interested. The most major one is SCHOOL ALGEBRA FROM CLASS III, a major breakthrough in math education in the world. It only advocates adoption of the most psychological strategy of instruction through pattern and design languages : other programmes are promotion of independent learning on the part of students through individual use of HANDS ON - KICK OFF - TAKE OFF learning kits, instituting of practicals test in mathematics, for making the assessment fair by taking into consideration non-verbal responses of learners, indegenisation of the curriculum through incorporation OF KOLAM AND FOLK MATH; appropriate incorporation of Ramanujan's creativity in classroom coverage of curricular themes, alternative ways of teaching certain crucial items in curriculum such as integers, identities, simple, quadratic and simultaneous equations, fractions and decimal fractions through paper folding (continuous) and bottle tops (discrete) etc., adoption of local axiomatisation to motivate global axiomatisation, use of square & triangular dot sheets, ruled sheets, square ruled sheets in visualisation of math, special care of the high achievers and low achievers, equipping the math section of the school library for updating and upgrading the professional skills of teachers, use of DOUBTS BOOK and DISCOVERIES BOOK, OBSERVATION BOOK and DATA BOOK by each pupil to be alive to one's environment and exhibit one's abilities, holding of DISCIPLINARY MEET and INTER-DISCIPLINARY MEET to help teachers get involved in developments in education disciplinarywise as well as inter-disciplinary wise, three day three-tier ANNUAL MATH EXPO to foster and sharpen receptivity of students through walk across the curriculum, to record CREATIVITY LEVEL of the learner in the progress report sent to parents by taking note of the nature, the depth and the range of questions raised, visuals in math question paper, math paper to cover interpretation as well, bulletin boards to publicise creativity of students, assembly talks to include wonders in mathematics, math teacher resource centre in flourishing schools, POP MATH SHOWS during school days such as magic square dance, wiz kid shows, showcasing in math, having mathematicians' portraits in principal's room, Ramanujan's in particular etc., Tremendous changes are seen in every aspect of life except in instructional situation in the school and more so in math class situation. How many know that learning styles are more varied than



teaching styles and mismatch between learning styles and teaching styles continues to mar the educational scenario in the school ! How many know that learning aids are different from teaching aids ! Is it not absurd if not hypocritical to talk of activity oriented learning when the furniture in the class room in majority of schools continues to consist of long benches facing the black board and the teacher? Since what is being attempted by this Museum with its adjunct of Mathematics Education Centre is supply without demand, it is well nigh impossible to work for financial support and hence get manpower. We need money and manpower and now machine power as well. Unless, the few people who realise the gravity of the situation and who care for the progeny and so posterity join hands and volunteer assistance in all possible ways, the prospects are bleak. In the brand of democracy which we practise, it is the vote bank politics that matters and so it is difficult to secure governmental attention for this vital aspect of nation building. Concern of the people is seen in sloganeering and gubernatorial exhortations.

### **WHY NOT COGNISABLE MERIT AS WELL?**

Moreover we have only cognisable offence and costly allocation of funds to curb it. How rapid would have been the development, if we have had cognisable merit with offer of time bound, result oriented, logistic assistance which unquestionably is least expensive! Fortunately mathematics is a universal subject of common interest to entire humanity. Once a dent is made in the sociological barrier that is witnessed today, rapid changes can be envisaged, as we see in the attempts made to stop environmental degradation all over the world. Thanks to Avvai Academy, a unique centre in our country today, Ramanujan Museum and Math Education Centre has been striving under the inspiration of Ramanujan who is a shining example of what mathematics means in getting sustainable joy all through one's life, to spell out realistic and tangible programmes, right from the family environment so as to secure mathematical enjoyment rights of every one, children in particular. The needs of the gifted or the talented continue to be ignored. Their plight is overlooked in the certificate oriented schooling. Some moves are made here and there to recognise them through performance in tests with patronage from parents. Unfortunately, tests are mostly substandard if not spurious, as there is a



commercial side to the exam. Commercialism blinds agencies from the harm that is caused to social fabric and individual health.

### WHY MATH CITY?

Dec. 22'99 that marked Ramanujan's 112th birthday saw the audience proposing to the Govt. at the Centre *observance of his birthday hence forth as creativity day*. Since repetition is living and innovation is life, an all out effort needs to be made by all concerned to provide a haven for the mathematically inclined and gifted souls and make the common man math friendly. The dream plan is to put up MATH CITY like Science City. Science is glamorous but Mathematics is spectacular. Let us not deny ourselves the thrills and joys of mathematical world made arrestingly accessible by high tech today. The Math City will improve the image of math in public mind so as to put teeth in genuine educational effort in mathematics learning and its fair evaluation. There is an apolitical minority that goes about contributing to the development of intellectual stature of oneself and others through their off beat excursions in the realm of creative thought. A section of this precious but precarious minority is so devoted to mathematics that the need for a centre where they can walk in with a sense of belongingness to share their concerns and ventures as to be recognised. Such a minority do not feel at home in a Science City, just as musicians are not interested in dance or art. Hence the imperative need for a math city. Moreover space for mathematics will be minimal in a Science City. In the math city, there will be access to all the best conceived in the past as well as in the present with originals collected from all over the world with provision for internet and other media covering facilities for telemeets etc.,

Let us strive for having a Ramanujan Museum Float in the next Republic Day Celebration at Delhi. Human Resource Development cannot afford to ignore mathematical resources. If anyone were to care to enquire about the number of mathematics education projects taken up with funding by Government at the Centre or any State Government, the sorry state of affairs will get exposed. Publishers are reluctant to publish books of general interest in mathematics as in the West. A lot has to be done and it can be done. Senior citizens can have a worthwhile time in working for this healthy trend in society. Youth can revel



in glory by taking trail-blazing programmes to usher in golden age in math education. Mothers who are awake and alive to world trends today can do a lot by learning and adopting ways and means of providing a family math atmosphere with due attention paid to number arrangements in the calendar and the clock. The least that everybody can do is to embellish greeting cards and invitation cards, welcome boards and installation stones with DATE MAGIC SQUARE and usher in a dramatic change in social atmosphere and give mathematics a place in cultural life of people. Also change from routine ribbon cutting to declare open new centres to cutting of mobius band will electrify the people's expectations about mathematical wonders. School managements have their special role to play in this renovative enterprise. What they need is a set of measures that will arrest and attract the attention of learners. Industrial and business managements should have parenting as a part of employees' welfare with practical guidelines in developing mathematical core in their children.

Ramanujan Museum and Math Education Centre has been set up with a mission and been earnestly seeking assistance while at the time offering assistance in this regard, by volunteering to promote a sense of pride in our heritage in mathematics and pave the way for rising to the eternal glory of human mind in this age of MATHEMATICS FOR ALL. Let not Trusts stop with building temples and schools, marriage halls and community centres, but come forward to give a helping hand in this great nation building task and earn name and fame that will be broadcast throughout the world.

### **ALL ROUND ACCESS FOR KNOWLEDGE**

Educational effort cannot and should not be confined to schools with their limited resources and expertise. It will be galvanised if backed by setting up of CURIOSINDOWS (Curiosity Windows) in all cultural, educational, industrial and service centres all over the country in this age of IT. It will be naive to expect teachers and parents to cater to knowledge needs of the youngsters today. Incidentally this move will make democracy healthy and upbeat and imbue business with responsibility and accountability as they would have to serve as super educational agencies. It would help people discover that ideas and values promote happiness and not materials which can only cater to



physical comfort. Commercialisation would get cleansed and citizenry unexploitable and receptive. Wide awake youth would emerge to sustain vibrant democracy that should seek strength through caring and sharing, as commercial agencies would only provide openings for entertainment and enjoyment and not enlightenment.

22.12.99

22	12	19	99
21	93	32	06
91	03	24	34
18	44	77	13

Two in one : Magic sum 152

12 + 19 = 13 + 18	03 + 24 - 06 = 21
22 + 13 = 32 + 03	93 + 32 - 34 = 91
99 + 18 = 93 + 24	32 + 24 - 12 = 44
22 + 18 = 34 + 06	93 + 03 - 19 = 77

Splitting with choice      Filling with no choice  
As entries are different, strategy of construction is transparent

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# SEE WITH MATHEMATICAL EYE

**1**

$$\begin{array}{ccc}
 0 & 0 & 0 \\
 0 & 0 & 0 \\
 0 & 0 & 0
 \end{array}
 \begin{array}{l}
 1 + 3 + 5 \\
 = 1 + 2 + 3 + 2 + 1 \\
 = (1 + 2 + 3) + (1 + 2)
 \end{array}$$

$$\begin{array}{cccc}
 0 & 0 & 0 & 0 \\
 0 & 0 & 0 & 0 \\
 0 & 0 & 0 & 0 \\
 0 & 0 & 0 & 0
 \end{array}
 \begin{array}{l}
 1 + 3 + 5 + 7 \\
 = 1 + 2 + 3 + 4 + 3 + 2 + 1 \\
 = (1 + 2 + 3 + 4) + (1 + 2 + 3)
 \end{array}$$

**2**



4      4      1      1

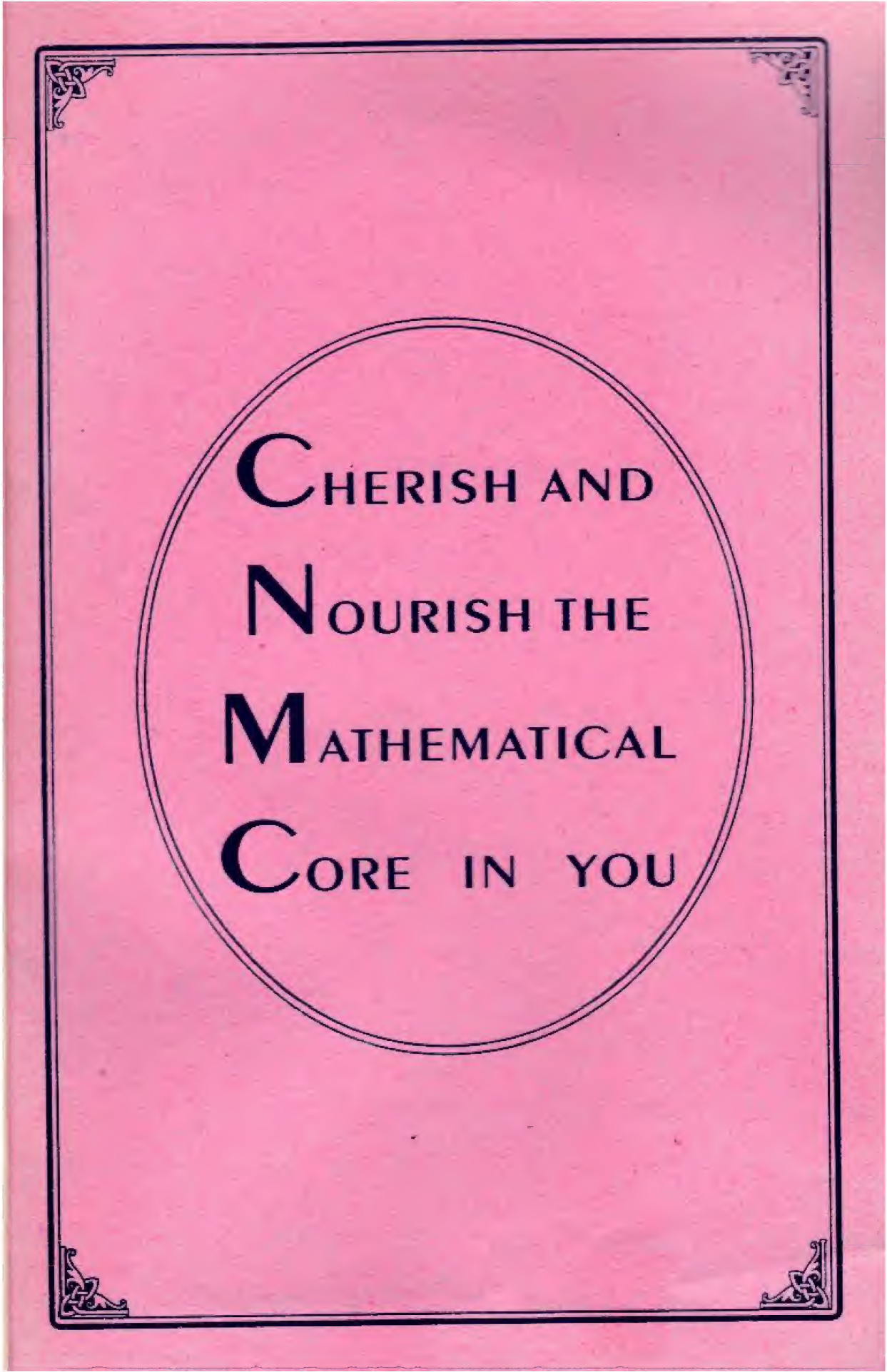


9      12      4      5



16      24      9      14





**C**HERISH AND  
**N**OURISH THE  
**M**ATHEMATICAL  
**C**ORE IN YOU



